

HAND BOOK ON RIVER BANK MAPPING AND SAND AUDITING



River Management Centre (RMC)
Institute of Land and Disaster Management (ILDM)
Department of Revenue and Disaster Management
Government of Kerala
Thiruvananthapuram
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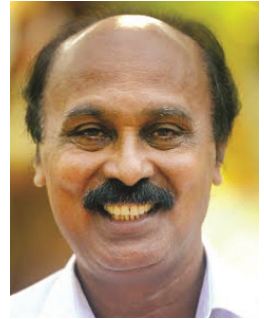
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Message

Sri. E. Chandrasekharan

Hon'ble Minister for Revenue,
Government of Kerala

Rivers are citadels of civilisation, yet, they are neglected, and this heritage resource has been used as commodity with little regard for its ecosystem services. Excessive sand mining, discharge of effluents, encroachments of river banks, construction works, along water lines, land reclamation and land use change in the river catchments have degraded the ecosystem to a level which is hard to restore to their actual facets. Kerala Protection of River Banks and Regulation of Removal of Sand Act, 2001 was passed by the State Legislature in order to restore and maintain the health of rivers and also to regulate mining of sand resources from rivers. However, the actual objectives of the act are not yet fulfilled and to certain extent, it is limited to sand mining and sanctioning of river bank protection works. River Bank Mapping and Sand Auditing, an integrated comprehensive programme was introduced in the State in 2011 with the long term vision of developing master plans for conserving 44 rivers in the State in a participatory manner. Now, River Bank Mapping of 17 rivers and Sand Auditing of 19 rivers have been completed and the works for 15 new rivers have been undertaken. It is the time to document our experience and note the series of activities that have undergone to accomplish this task and move forward. I sincerely appreciate the efforts of the team in bringing out this handbook. I do hope that this document will be useful for all those interested to protect our rivers and bring back their lost glory to save us and to save our civilisation.

Good wishes.

A handwritten signature in black ink, appearing to read 'E. Chandrasekharan', with a horizontal line underneath.

E. Chandrasekharan
Minister for Revenue & Disaster Management



Dr. V. VENU, IAS
Principal Secretary

Foreword

Water is one of the most important components of earth system machinery and it constitutes the largest flow of any material through the biosphere. There is almost no other ecosystem type that offers such a remarkable variety of goods and services to humans like rivers, their flood plains, aquifers and wetlands. However, human activities have largely impaired the aquatic system. In recent years, rivers are under stress and this fact is globally well recognized. The United Nations Water Conference in Mar del Plata, Argentina in March, 1977 epitomised the concern about the availability of fresh water. The thirteenth Stockholm Water Symposium in 2003 focused on drainage basin security. Restoration and management of rivers are globally stressed and almost all countries across the World initiated river restoration activities.

Kerala is well endowed with river resources. However, almost all rivers in the State are under varying degrees of stress. River bed sand mining, widely practiced in Kerala, crossed the threshold of regeneration and in many stretches channel dimension has been altered beyond recognition. Occupancy of flood plain, loss of riparian vegetation, deterioration of water quality and over all degradation of river ecology has compounded the problem. The situation warrants coordinated approach, re-examination of ongoing activities along the river corridors and in their catchment and design specific intervention measures to restore the original river character.

Considering the problems of rivers and urgent need to restore them, the Revenue Department, in 2011, initiated a programme consisting of two core activities: (i) Mapping of the river bank covering land use, manmade features and physical features towards developing a data base and (ii) Assessment of sand deposits (Sand Auditing) in the river beds for its ecological and economic utilization. Uniqueness of this programme is in the involvement of S & T departments, Engineering Colleges, University Departments and NGOs. At present, works have been completed in 19 rivers of Kerala and 14 new rivers are taken up for the second phase. Steps have been also initiated to conduct second phase sand auditing of 6 more rivers in the context of Flood 2018. River Management Funds (RMF) at the disposal of the District Collectors are being used for this programme. The River Management Centre (RMC), ILDM under the Revenue Department and National Centre for Earth Science Studies (NCESS) provide assistance to the Revenue Department to coordinate these activities. The methodology has been developed by NCESS with inputs from RMC, ILDM.

This work is a pioneering initiative in the country. In 2013, this programme was short listed for Innovation Award Programme of Government of India. Other States have shown interest in this programme. This Handbook spells out the details of the methodology and modalities to take up this work elsewhere as well along with progress of work in Kerala. I appreciate the efforts of the team to bring out this handbook and I do believe that this document will find wider use.



Smt. C. A. LATHA, IAS
Land Revenue Commissioner

Message

Rivers, although carry a miniscule of total water resource in the world, play a very vital role in human life and progress of civilization. Apart from ecosystem services, rivers also provide a cultural interface between nature and human being. Over the past half a century there had been perceptible change in our understanding about the river ecosystem. Once they were treated as a source of resource in the upstream and sink of waste in the downstream. Today thrust is more to revive symbiotic relationship between river and human beings and thus programmes are designed accordingly across the world.

Kerala is blessed with 44 rivers along with numerous streams. The Kerala Protection of River Banks and Regulation of Removal of Sand Act, 2001 was enacted for the protection and management of the rivers treating the river as a natural ecosystem in the State. This Act vested ample powers with the Revenue Department for the conservation of rivers in the State. Revenue Department is committed to protect the rivers and its banks from all kinds of exploitations.

Lack of scientific information on rivers and absence of comprehensive plans for rejuvenating the rivers warranted the Government to introduce 'River Bank Mapping and Sand Auditing' programme in the State during 2011-2012. So far sand auditing of 19 rivers and river bank mapping of 17 rivers were completed in the State. Based on sand auditing, sand mining is banned for three years in 12 rivers in the State where sand deposits are not available for sustainable mining. Strict legal measures are being taken by the Revenue and Police Departments in the State against illegal sand mining of any kind from these rivers. Presently river bank mapping and sand auditing of 14 rivers in the State is in progress and steps have been initiated to conduct second phase sand auditing of 6 rivers in the context of Flood 2018. It was a felt need to bring out a good document of this programme dealing with the modalities to be followed in executing this work by various educational, research and scientific organizations. I congratulate the efforts of the team in preparing this handbook and wish all the best for those who use this handbook.

ms
1/2/2019

C. A. LATHA, IAS

ACKNOWLEDGEMENT



Sri. P. G. THOMAS

Director

The programme on 'River Bank mapping and Sand Auditing' was initiated by the Revenue Department, Government of Kerala with the objectives of protection and rejuvenation of rivers and to assess mineable quantity of sand from the river beds. It was felt that a document detailing the methodology, various modalities required to start river bank mapping and sand auditing is necessary to help technical management and also administration. I thank the Revenue Department for entrusting this challenging job to us.

The Hon'ble Minister for Revenue, Sri. E. Chandrasekharan is gratefully acknowledged for his profound leadership in the Department; valuable guidance and encouragement to this programme.

Dr. V. Venu IAS, Revenue Principal Secretary, and Sri. P H Kurian IAS, Former Additional Chief Secretary, Revenue and Disaster Management Department took special interest and extended all necessary support to bring out this handbook. I take this opportunity to thank him.

The idea to prepare this Handbook was germinated in the mind of Dr. Nivedita P Haran, then Addl. Chief Secretary, Revenue Department, who was the spirit behind this programme. I gratefully acknowledge her contribution in this matter. I would also like to thank Smt. C.A.Latha IAS, Land Revenue Commissioner and Sri. A.T. James IAS, Former Land Revenue Commissioner, Sri. C. Reghu IAS, Sri. N. Padmakumar IAS, Smt. Rajeswary P.A, Sri. V. Jayamohan and other officers of ILDM and Revenue Department.

At this juncture, let me express my deep felt gratitude to Dr. K Soman, former Head, Resources Analysis Division, CESS for providing valuable technical support and guidance. I also thank Sri. K Bhaskaran, former member of the State High Level Committee (RMF) and the present members of the State High Level Committee for showing interest in this programme.

I sincerely acknowledge Dr. Srikumar Chattopadhyay, Sri. John Mathai, former Scientists of NCESS and Dr. D. Sajith Babu IAS for their invaluable contribution in developing the methodology and for the involvement in the preparation of this handbook. Thanks are due to Sri. K. Madhusoodanan, Dr. Shaji J and Smt. Saniya N for their sincere support at various stages of this work.

A handwritten signature in blue ink, appearing to read 'P. G. Thomas'.

P. G. Thomas I A S (Retd)

Director

Institute of Land and Disaster Management (ILDM)

Thiruvananthapuram

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